PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP2004/052760	02.11.2004	03.11.2003

International Patent Classification (IPC) or both national classification and IPC
C12N15/29, C12N15/82, C12N5/10, C07K14/415, A01H5/10

Applicant
BIOGEMMA

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☒ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☒ in written format

   ☒ in computer readable form

   c. time of filing/furnishing:

   ☒ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☒ furnished subsequently to this Authority for the purposes of search.

3. ☒ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-3,17-19,21,22
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-3,17-19,21,22
Industrial applicability (IA)	Yes:	Claims	1-30
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

The present communication refers to the following documents cited in the search report:

D1: DATABASE EMBL [Online] 25 August 2003 (2003-08-25), WHITELAW C. ET AL.: retrieved from EBI Database accession no. CG044206

D2: DATABASE EMBL [Online] 19 March 2003 (2003-03-19), WHITELAW C. ET AL.: retrieved from EBI Database accession no. BZ785501

D3: DATABASE EMBL [Online] 18 July 2003 (2003-07-18), GENOPLANTE: retrieved from EBI Database accession no. CF006083

D4: DATABASE EMBL [Online] 18 July 2003 (2003-07-18), GENOPLANTE: retrieved from EBI Database accession no. CF006331

D5: DATABASE EMBL [Online] 18 July 2003 (2003-07-18), GENOPLANTE: retrieved from EBI Database accession no. CF006827

D6: DATABASE EMBL [Online] 6 October 1999 (1999-10-06), WALBOT V.: retrieved from EBI Database accession no. AW062022

D7: DATABASE EMBL [Online] 28 February 2001 (2001-02-28), SINGH J. ET AL.: retrieved from EBI Database accession no. BG320929

D8: WO 99/50427 A (YAN GUO ; MAX PLACK GES ZUR FOERDERUNG D (DE); SALAMINI FRANCESCO (DE)) 7 October 1999 (1999-10-07)

Subject-matter of the application

The application relates to the cloning of MEG1 endosperm-specific promoters and corresponding genes from maize. The expression of said promoters and genes is confined to the basal endospermal transfer layer (BETL) at a very early stage of seed development. A consensus sequence was identified which is common to the disclosed MEG1 protein variants. The use of the said genes for establishing pathogen resistance is claimed.

Re item V: Novelty and Inventive step

1. The present MEG1 cDNAs, genomic sequences, polypeptide sequences and promoters according to the SEQ ID Nos as claimed have not been disclosed or suggested in the art and are consequently regarded as novel and inventive.

2. Present claim 1, however, extends the subject-matter according to the present SEQ IDs to fragments, hybridizing sequences and sequences that comprise nucleotide sequences which are conserved among at least two of SEQ ID NO:1-3.

D1 discloses a genomic clone from maize showing 88-99% identity to at least parts of SEQ ID NO:1-3. Said parts comprise in any case the TATA box region and additional stretches of SEQ ID NO:1-3. Further, several stretches of the nucleic acid sequence of D1 are 100% identical to either of the presently disclosed promoter sequences.
In consequence, D1 fulfills the requirements of claim 1 parts b)-e) as well as claims 2 and 3 which are not novel **(Article 33(2) PCT)**.
(for the interpretation of the terms "promoter activity specific to the endosperm" and "maternal parent of origin pattern" see clarity section below).

3. Claim 17 extends the subject-matter of the presently disclosed polynucleotide and polypeptide sequences to variants, fragments and hybridizing sequences.

   Either of D2-D7 disclose EST sequences which are >90% identical to the presently claimed SEQ ID Nos, some even 100% to large parts of said molecules.
   The sequences disclosed in D2-D7 thus fulfill the requirements of claim 17 parts a), c) and d). Claims 17-19, 21 and 22 are not novel **(Article 33(2) PCT)**.

Re Item VIII: Clarity

1. The term "fragment" as used in claim 17 d) also comprises parts of the polypeptide molecule that do not sufficiently characterize the subject matter disclosed in the application, e.g. single amino acids. This term consequently is not clear.
   The same applies for the term "variants thereof" as used in claim 17 a).

2. The terms "promoter activity specific to the endosperm" and "maternal parent-of-origin pattern of expression" are not clear. Due to the lack of a technical feature in the claim which is responsible for said characteristics, i.e. for example an endosperm-specific box identified in the promoter, the said sequences cannot readily be distinguished from those as disclosed in D1. It has thus to be assumed that also the genomic sequence of D1 comprises those parts which are responsible for said characterizing features.